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Assessment of Climate Change Impacts on Droughts Characteristics in Nigeria

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The changing characteristics of droughts during cropping seasons have been assessed for Nigeria. The standardized precipitation evapotranspiration index (SPEI) was used for the reconstruction of 100-year droughts using gauge-based gridded precipitation and temperature data with a spatial resolution of 0.5º. A 50-year moving window with a 10-year time step was used to assess the temporal variations in droughts and its relationships with precipitation and temperature. The modified Mann-Kendall test and the binary logistic regression were used for the estimation of the trends in droughts affected areas and the occurrence of droughts with different areal extents during major cropping seasons. The results revealed that the areal extent of droughts was increasing up to 10.38 km2/decade for some cropping seasons and the return periods of droughts were decreasing for all the seasons. The occurrence of small areal extent moderate droughts was increasing more compared to other categories. Rainfall was the most influencing factor in defining droughts in the southern part while temperature was in the arid north. Rises in temperature in the range of 0.14-0.42 ℃/decade and almost no change in rainfall have caused decreases in SPEI up to -0.25 per decade and therefore, increase in frequency and severity of droughts.